PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number.	:	10/798,669	Confirmation Number.	:	6277
Applicants	:	David J. Wendell *et al.*			
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Examiner	:	Michael C. McCullough			
Docket Number	:	247171-00426USP1			
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Commissioner for Patents
P.O. Box 1450
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APPEAL BRIEF PURSUANT TO 37 C.F.R. § 41.37

Dear Sir:

This Appeal Brief relates to U.S. Serial No. 10/798,669 (U.S. Publication No. 2005/0006197, attached as Exhibit A) and is filed pursuant to the Appellant's appeal to the Board of Patent Appeals and Interferences from the rejection of claims 1-27 in the Final Office Action dated January 7, 2009 (Exhibit B). In response to the Final Office Action, a Notice of Appeal was filed on March 6, 2009 (Exhibit C), along with a Pre-Appeal Request for Review (Exhibit D). On October 19, 2009, the Patent Office issued a Notice of Panel Decision from Pre-Appeal Brief Review (Exhibit E) stating that the Applicants should proceed to Board of Patent Appeals and Interferences.

The due date for this Appeal Brief is one month from the Notice of Panel Decision from Pre-Appeal Brief Review mailing date, i.e., November 19, 2009.

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I. REAL PARTY IN INTEREST

The real party in interest is Cummins-Allison Corp., having a place of business at 891 Feehanville Drive, Mt. Prospect, IL 60056.

II. RELATED APPEALS AND INTERFERENCES

In view of MPEP § 1205.02, the following appeals are noted.

1. Application No. 10/963,314, Notice of Appeal Filed October 23, 2008.

2. Application No. 10/798,669, Notice of Appeal Filed March 6, 2009.

As presently understood, the requirement to identify related proceedings requires Appellants to identify every "related proceeding" such as those having a "claim to a common priority application" which "may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal." While not believed to directly affect or having a bearing on the Boards' decision in the pending appeal, the information on the above cases are nonetheless submitted herewith for completeness.

III. STATUS OF CLAIMS

Claims 1-27 are presently pending and finally rejected.

IV. STATUS OF AMENDMENTS

No amendments were submitted or filed subsequent to the Final Office Action dated January 1, 2009 (Exhibit B).

V. SUMMARY OF CLAIMED SUBJECT MATTER

Pursuant to 37 C.F.R. § 41.37 (c)(1)(v) exemplary references to the specification by page and line number and to the drawings and reference characters are including in the below summary of the independent claims. Such references are by way of example only and are not to be construed in a limiting manner. Reference also will be made herein to Appellant's published application, US 2005/0006197 (Exhibit A).

A. Independent Claim 1

Claim 1 calls for a continuously rotatable disc 114 for imparting motion to a plurality of coins of mixed denominations, wherein a rate of rotation is adjustable. The rotatable disc 114 can be mounted for rotation on a shaft and driven by an electric motor 116. Page 6, lines 24-33, Exhibit A, ¶ [0033]. The power supplied to the motor 116 can be controlled by a controller 280/850, thus controlling the speed of the rotatable disc 114. Page 15, lines 6-14, Exhibit A, ¶¶ [0061]-[0062]. An encoder 284 attached to the rotatable disc 114 produces an encoder pulse for each incremental movement of the rotatable disc 114. Page 14, lines 20-32, Exhibit A, [0059]. The encoder 284 can have a resolution of, for example, 2000 pulses per revolution, and can be a dual channel encoder utilizing two encoder sensors. Page 14, lines 20-32 - page 15, lines 1-5, Exhibit A, ¶¶ [0059]-[0060]. A memory 288 is adapted to store master denominating characteristic information including a plurality of predetermined numbers of encoder pulses for each coin. Page 16, lines 1-19, Exhibit A, ¶¶ [0064]-[0066]. The predetermined number of encoder pulses stored in the memory 288 for each coin corresponds to the size of the particular coin denomination the coin processing system is adapted to process. *Id.*

Claim 1 also calls for a stationary sorting head 112/702 having a lower surface generally parallel to and spaced slightly away from the rotatable disc 114, the lower surface forming a coin path for directing the movement of each of the coins (page 7, lines 17-32 – page 8, lines 1-33. Exhibit A, ¶¶ [0036]-[0040]) and a coin exit region (e.g., coin exit channels 261-268) for sorting and discharging coins of particular denominations, *see* page 13, lines 23-32 – page 14, lines 1-10, Exhibit A, ¶¶ [0056]-[0057]. The coins can be discriminated using an optical coin discrimination sensor 700. Page 28, lines 22-33, Exhibit A, ¶ [0103]. This is shown, for example, in FIGs. 14a and 14b:

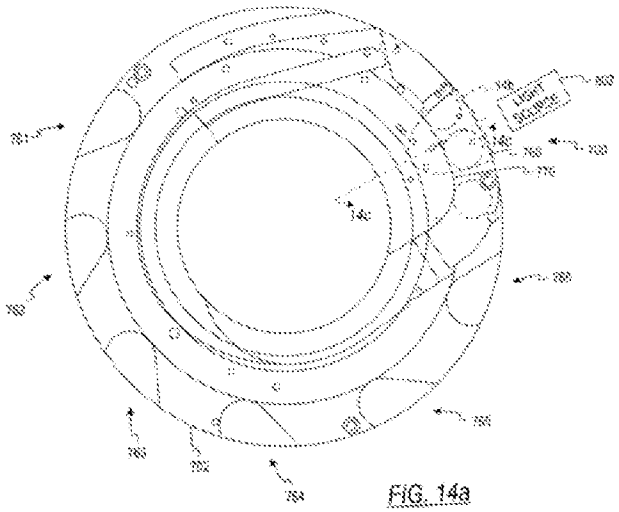

FIG. 14a

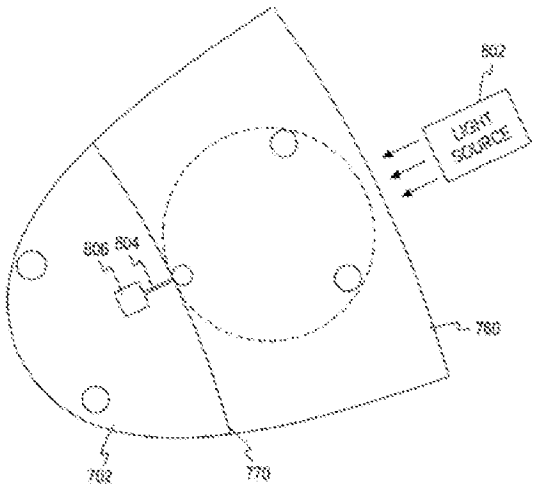

FIG. 14b

The optical coin discrimination sensor 700 includes a light source 802 for outputting a light beam that traverses the coin path in substantially the same plane as the coin path. Page 29, lines 19-27, Exhibit A,¶ [0105]. A light detector 808 for detecting the light beam is adapted to generate a light-detection signal indicative of detecting the light beam. Page 29, lines 19-27, Exhibit A, ¶ [0105]. As each coin (shown as a dotted circle) moves along the coin path and passes through the light beam (shown as three arrows), the generation of the light-detection signal is suspended. Page 29, lines 19-27, Exhibit A, ¶ [0105].

The controller 850 is adapted to receive the encoder pulses from the encoder 284 and the light-detection signal from the light detector 808. Page 32, lines 12-31, Exhibit A, ¶¶ [0115]-[0116]. The controller 850 determines the number of encoder pulses received during a period of non-receipt of the light-detection signal caused by each coin passing through the light beam. Page 32, lines 20-31, Exhibit A, ¶ [0116]. When the controller 850 begins receiving the light-detection signal again (e.g., the coin has completed passing through the beam), the controller 850 compares the determined number of encoder counts to the master denominating characteristic information stored in the memory 288 to determine the denomination of the coin. Page 32, lines 32-33 – page 32, lines 1-22, Exhibit A, ¶¶ [0117]-[0118].

B. Independent Claim 10

Claim 10 calls for a method for processing coins with a coin processing system 100 including at least one coin path and a plurality of coin exit regions 261-268 for sorting and discharging coins of particular denominations. The system includes a light source 802 disposed

on one side of the coin path. Page 29, lines 19-27, Exhibit A, ¶ [0105]. This is shown in FIG. 14b, reproduced above.

The method includes moving a coin along the coin path defined by a stationary sorting head 112/702 of a high-speed coin processing machine 100 at a rate that can be adjusted. Page 15, lines 6-14 and page 28, lines 122-33, Exhibit A, ¶¶ [0061]-[0062], [103]. The method also includes emitting a light beam across the coin path in substantially the same plane as the coin path to a light detector disposed 808 on another side of the coin path. The light source 802 emits a light beam, through light guides 804, 806, across the coin path and onto the light detector 808. Page 29, lines 19-27, Exhibit A, ¶ [0105].

The method also includes interrupting, with the coin moving along a portion of the coin path between the light source 802 and the light detector 808, the light beam traversing the coin path such that the light beam is not incident on the light detector 808. As a coin moves along the coin path, it passes between the light source 802 and the light detector 808, interrupting the light beam for the period of time that the coin is between the light source 802 and the light detector 808. Page 29, lines 19-33, Exhibit A, ¶¶ [0105]-[0106]. This is shown in FIG. 14b as a dotted circle between the light source 802 and the light guides 804, 806, which direct the light to the detector 808. The method also includes counting, with a controller 850, the number of encoder pulses generated by an encoder 284 during the interruption of the light beam, page 32, lines 20-31, Exhibit A, ¶ [0116], and comparing the counted number of encoder pulses to a plurality of stored numbers of encoder pulses corresponding to the particular coin denominations, page 32, lines 31-32 – page 33, lines 1-22, Exhibit A, ¶¶ [0117]-[0118]. The plurality of stored numbers of encoder pulses are stored in a memory 288. Page 33, lines 8-22, Exhibit A, ¶ [0118].

C. Independent Claim 22

Claim 22 calls for a method for determining the denomination of a coin with a disk-type coin processing system 100. The method includes moving a plurality of coins along a coin path with a continuously rotatable disk 114, wherein a rate of rotation is adjustable. Page 6, lines 24-33, Exhibit A, ¶ [0033]. The power supplied to the motor 116 can be controlled by a controller 280/850, thus controlling the speed of the rotatable disc 114. Page 12, lines 6-14, Exhibit A, ¶¶ [0061]-[0062]. The method also includes generating an encoder pulse for each incremental movement of the continuously rotatable disk 114. An encoder 284 attached to the rotatable disc 114 produces an encoder pulse for each incremental movement of the rotatable disc 114. Page

14, lines 20-32, Exhibit A, [0059]. The encoder 284 can have a resolution of, for example, 2000 pulses per revolution, and can be a dual channel encoder utilizing two encoder sensors. Page 14, lines 20-32 – page 15, lines 1-5, Exhibit A, ¶¶ [0059]-[0060].

The method also includes directing a light beam to traverse the coin path in substantially the same plane as the coin path. A light source 802 can emit a light beam, through light guides 804, 806, across the coin path and onto a light detector 808. Page 29, lines 19-27, Exhibit A, ¶ [0105], FIGs. 14a, 14b. The method also includes interrupting the light beam traversing the coin path for a period in which a coin of the plurality of coins is moving through the light beam traversing the coin path. As a coin moves along the coin path, it passes between the light source 802 and the light detector 808, interrupting the light beam for the period of time that the coin is between the light source 802 and the light detector 808. Page 29, lines 19-33 – page 30, lines 1-3, Exhibit A, ¶¶ [0105]-[0106], FIGs. 14a, 14b.

The method also includes counting a number of encoder pulses occurring during the period, page 32, line 20-31, Exhibit A, ¶ [0116], and comparing the counted number of encoder pulses to a plurality of stored numbers of encoder pulses corresponding to the particular coin denominations, Page 32, lines 32-33 – page 33, lines 1-22, Exhibit A, ¶ [0117]-[0118]. The plurality of stored numbers of encoder pulses are stored in a memory 288. Page 33, lines 8-22, Exhibit A, ¶ [0118].

D. Independent Claim 23

Claim 23 calls for a method for determining the denomination of a coin with a disk-type coin processing system 100. The method includes moving a plurality of coins along a coin path with a continuously rotatable disk 114, wherein a rate of rotation is adjustable. Page 6, lines 24-33, Exhibit A, ¶ [0033]. The power supplied to the motor 116 can be controlled by a controller 280/850, thus controlling the speed of the rotatable disc 114. Page 15, lines 6-14, Exhibit A, ¶¶ [0061]-[0062].

The method also includes generating an encoder pulse for each incremental movement of the continuously rotatable disk 114. An encoder 284 attached to the rotatable disc 114 produces an encoder pulse for each incremental movement of the rotatable disc 114. Page 14, lines 20-32, Exhibit A, [0059]. The encoder 284 can have a resolution of, for example, 2000 pulses per revolution, and can be a dual channel encoder utilizing two encoder sensors. Page 14, lines 20-32 – page 15, lines 1-5, Exhibit A, ¶¶ [0059]-[0060].

The method also includes directing a light beam to traverse the coin path in substantially the same plane as the coin path and detecting the light beam with a light detector 808. A light source 802 can emit a light beam, through light guides 804, 806, across the coin path and onto a light detector 808. Page 29, lines 19-27, Exhibit A, ¶ [0105], FIGs. 14a, 14b. The method also includes developing a signal at the light detector indicating the presence of a coin of the plurality of coins in the coin path. As a coin moves along the coin path, it passes between the light source 802 and the light detector 808, interrupting the light beam for the period of time that the coin is between the light source 802 and the light detector 808. Page 29, lines 19-33 – Page 30, lines 1-3, Exhibit A,¶¶ [0105]-[0106], FIGs. 14a, 14b. The light detector 808 can output a voltage corresponding to the level of received light, including a signal below a threshold voltage that indicates the presence of a coin. Page 5, lines 3-4, Exhibit A, ¶ [0014].

The method also includes counting a number of encoder pulses occurring while developing the signal at the light detector, Page 32, lines 20-31, Exhibit A, ¶ [0116] and comparing the counted number of encoder pulses to a plurality of stored numbers of encoder pulses corresponding to the particular coin denominations, Page 32, lines 32-33 – page 33, lines 1-22, Exhibit A, ¶¶ [0117]-[0118]. The plurality of stored numbers of encoder pulses are stored in a memory 288. Page 33, lines 8-22, Exhibit A, ¶ [0118].

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether pending claims 1, 2, 5, 8-14, and 16-20 are unpatentable under 35 U.S.C. § 103(a) over Hossfield (US 5,684,597) (Exhibit F) in view of Rasmussen (US 5,227,651) (Exhibit G).

2. Whether pending claims 3, 4, 6, 7, 15, and 21 are unpatentable under 35 U.S.C. § 103(a) over Hossfield in view of Rasmussen and in further view of Panzeri (US 6,142,285) (Exhibit H).

3. Whether pending claims 22-27 are unpatentable under 35 U.S.C. § 103(a) over Hossfield in view of Rasmussen.

VII. ARGUMENT

The following remarks in Sections VII.A and VII.B address the 35 U.S.C. § 103(a) rejections of claims 1, 2, 5, 8-14, 16-20 and 22-27 over Hossfield (US 5,684,597) (Exhibit F) in view of Rasmussen (US 5,227,651)(Exhibit G).

As an initial matter, it is respectfully submitted that the Examiner has not set forth a *prima facie* case of obviousness. "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be 'some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.'" *KSR*, 127 S. Ct. at 1741 (*citing In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

The Federal Circuit has stated that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), *cited with approval in KSR*, 550 U.S. at 418. Moreover, the Board of Patent Appeals and Interferences has routinely reversed Examiner's for premising assertions of *prima facie* obviousness under 35 U.S.C. § 103 upon speculation or conjecture. *See, e.g., Ex parte Butterfield* (Appeal No. 2009-002995, Application 11/671,818)(Bd. Pat. App. & Inter. July 30, 2009); *Ex parte Anders* (Appeal No. 2009-000424, Application 10/759,931)(Bd. Pat. App. & Inter. July 28, 2009); *Ex parte Grunau* (Appeal No. 2009-000614, Application 10/995,959)(Bd. Pat. App. & Inter. July 9, 2009); *Ex parte Preisach* (Appeal No. 2009-003219, Application 10/752,022)(Bd. Pat. App. & Inter. June 30, 2009)(stating that "[a] rejection based on § 103 must rest upon a factual basis rather than conjecture or speculation" and that "'[w]here the legal conclusion [of obviousness] is not supported by facts it cannot stand.'" *citing In re Warner*, 379 F.2d 1011, 1017 (CCPA 1967) and *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006))); *Ex parte Cohen-Solal* (Appeal No. 2008-005770, Application 09/896,199)(Bd. Pat. App. & Inter. June 30, 2009).

In the instant rejections, the Examiner makes statements about what "would have been obvious" to "one of ordinary skill in the art" at the time of the invention, but the Examiner's assertions are incongruent with the disclosure of the references and the Examiner has not discharged his duty to set forth ***facts*** supporting the assertion of *prima facie* obviousness.

A. Even Combined, Neither Hossfield Nor Rasmussen Teach All Elements of the Rejected Claims

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *See U.S. Surgical Corp. v. Ethicon, Inc.,* 103 F.3d 1554, 1564 (Fed. Cir. 1997)(affirming a district court's instructions to a jury that "the prior art must show not only all of the elements of the claimed combination, but must contain some 'teaching, suggestion or incentive' to a person of ordinary skill to combine the known elements in the way that" the inventor combined them"); *Abbott Labs. v. Sandoz, Inc.*, 500 F. Supp. 2d 846, 851 (N.D. Ill. 2007) ("the need to demonstrate the presence of all claim limitations in the prior art (when the legal theory is based upon obviousness due to the combination of prior art teachings) has not been obviated" by *KSR*) *aff'd* 544 F.3d 1341 (Fed. Cir. 2008); *see also In re Royka*, 490 F.2d 981 (CCPA 1974). The Examiner bears the initial burden to factually support and establish *prima facie* obviousness under 35 U.S.C. § 103. *See, e.g., In re Rijckaert*, 9 F.3d 1531, 1532 (Fed. Cir. 1993); *Ex parte Koo*, Appeal No. 2008-1344 (BPAI Nov. 26, 2008), slip. op. at 8; *see also Ex Parte Wada* (*stating* "a searching comparison of the claimed invention – *including all its limitations* – with the teaching of the prior art."), Appeal 2007-3733 (BPAI, Jan. 14, 2008)(emphasis in original), slip. op. at 7.

1. Neither Hossfield Nor Rasmussen Discloses Emitting a Light Beam Substantially in the Same Plane as the Coin Path

Claims 1, 10, 22, and 23 recite that a light beam is emitted or directed in substantially the same plane as the coin path. Specifically, claim 1 requires "a light source for outputting a light beam that traverses the coin path in substantially the same plane as the coin path," claim 10 requires "emitting a light beam across the coin path in substantially the same plane as the coin path to a light detector disposed on another side of the coin path," and claims 22 and 23 each require "directing a light beam to traverse the coin path in substantially the same plane as the coin path." This is shown, for example, in FIGs. 14 a and 14b, where the coin is shown moving along in the queuing channel 760, with the light source 802 directing light toward the first and second light guides 804, 806, and in the same plane as the coin (the dotted circle):

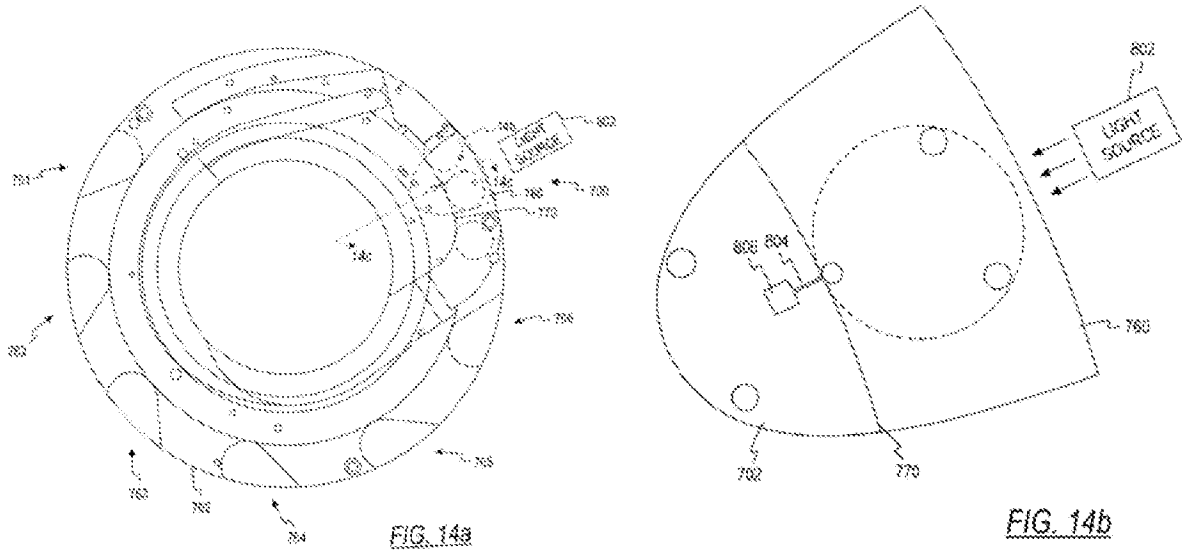

FIG. 14a FIG. 14b

See also ¶ [0105].

Hossfield teaches emitting a light beam orthogonal to the coin path, rather than in the same plane. This is shown in FIG. 2 of Hossfield, where the detector 50b is shown opposite LED 48b, which shines light perpendicular to the plane in which the coin travels:

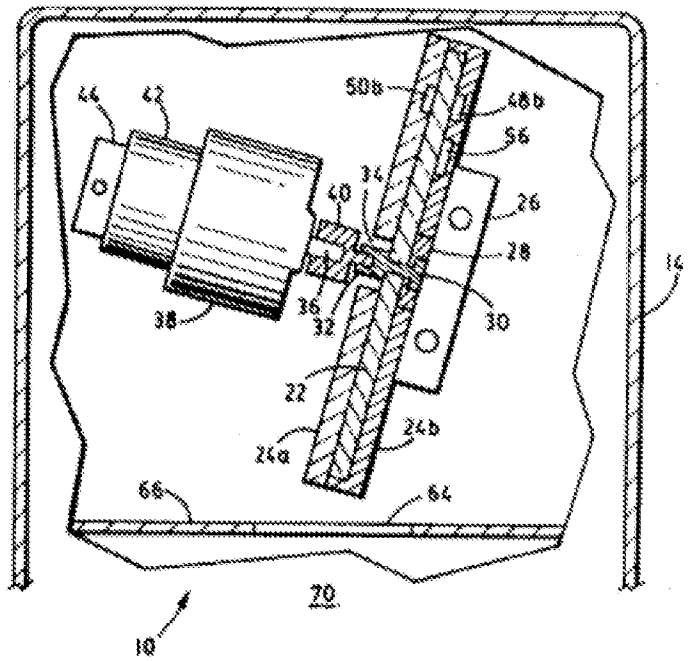

FIG. 2

See also Hossfield at col. 3, lines 46-50.

The "path" taken by a coin in Hossfield's device is clearly orthogonal to the light beam: "That is, coin 82a or b has a fixed relationship with respect to disk 22 during the portion of time when diameter is being discriminated and the velocity of coin 82a or b is accurately controlled along a ***predetermined arcuate path from the orientation of FIG. 5 to the orientation of FIG. 7. The path passes light sensors 52a and b.***" Hossfield, at col. 8, lines 32-37. *See also* FIG. 5 and FIG. 7:

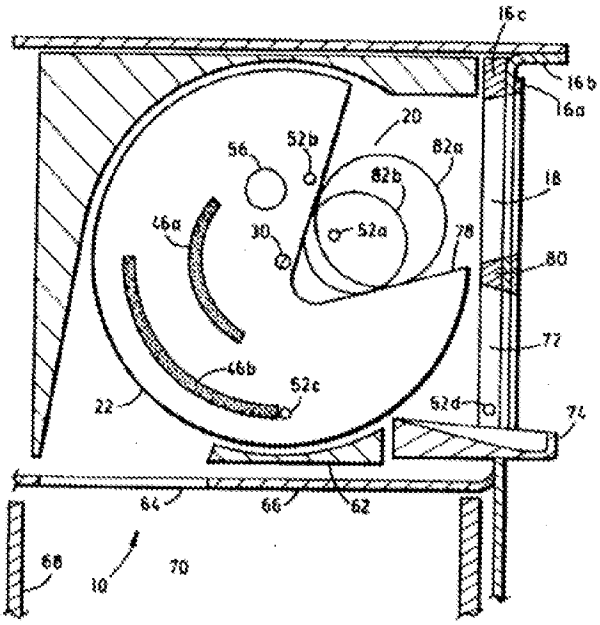

FIG. 5

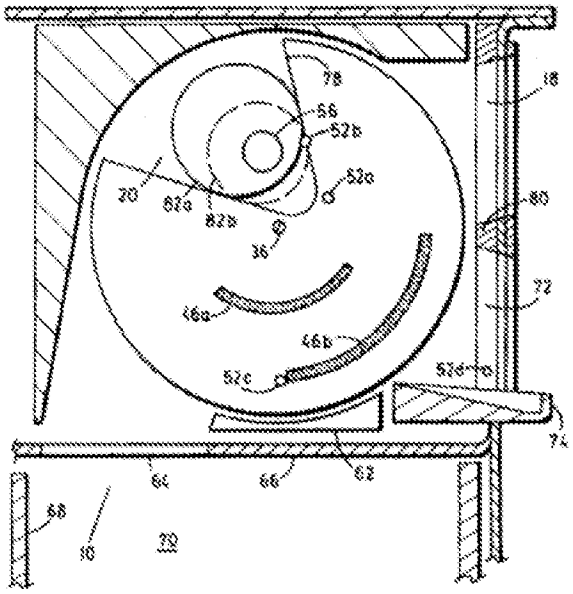

FIG. 7

In Hossfield's device, the coin travels in a first plane. The light beam travels in a ***different*** plane, namely one that is orthogonal to the plane in which the coin travels. The claims require that the light beam be emitted or directed in substantially the ***same*** plane. Hossfield does not disclose this limitation of the claims.

The Final Office Action states that "[t]he plane of the coin path [in Hossfield] can be considered the plane that contains the light emitters and detectors and therefore the light emitted traverses the path in the same plane as the coin path." Office Action at 5-6. The Applicants respectfully submit that this is not a reasonable reading of "substantially the same plane as the coin path." The plain meaning of "substantially the same plane as the coin path" is the plane in which the coin travels as it is directed by the coin path. This is consistent with the Applicants' specification, which depicts the light shining in the same plane as the coin is directed to travel in. *See, e.g.,* FIGs. 14a and 14b, reproduced above.

Rasmussen does not teach emitting a light beam, much less emitting a light beam in substantially the same plane as the coin path. Thus, neither Hossfield nor Rasmussen, alone or combined, discloses all elements of the rejected claims. Accordingly, each of the rejected claims is patentable over Hossfield in view of Rasmussen. *See U.S. Surgical Corp.,* 103 F.3d at 1564.

2. Neither Hossfield nor Rasmussen, Alone or In Combination, Discloses Comparing a Determined Number of Encoder Counts to Stored Master Denominating Characteristic Information

Claim 1 requires "the controller being adapted to compare the determined number of encoder counts to the stored master denominating characteristic information" and claims 10, 22, and 23 each require "comparing the counted number of encoder pulses to a plurality of stored numbers of encoder pulses corresponding to the particular coin denominations." For example, the specification explains that

> [0117] Using the number of encoder pulses during which the controller 850 is not receiving the light-detection signal from the detector 808, the controller 850 determines the diameter of each passing coin, which can be used to discriminate the denomination of the coin. For example, in the U.S. coin set, each of the coins--pennies, nickels, dimes, quarters, half-dollar coins, and dollar coins--have a different diameter. . . .
>
> [0118] According to one embodiment of the present invention, the memory 288 of the coin processing system 100 has stored therein a master denominating characteristic information that includes the number of encoder pulses and the corresponding coin denominations that the system 100 is designed to process. The number of encoder pulses for each coin denomination corresponding to the size (e.g., the diameter) of each coin. This information maybe stored in the form of a look-up table (LUT).

Specification, Exhibit A, at ¶¶ [0117]-[0118].

Neither Hossfield nor Rasmussen discloses comparing a counted number of encoder pulses to stored numbers of encoder pulses corresponding to coin denominations. The Examiner has acknowledged that Hossfield "does not disclose an encoder that produces an encoder pulse for each incremental movement of the rotatable disc . . . ." Final Office Action at 2. Instead, the Examiner contends that "Rasmussen et al. discloses a similar device that includes an encoder (see column 12 lines 16-24) . . . ," and that "[i]t would have been obvious for a person of ordinary skill in the art at the time of the applicant's invention to modify Hossfield et al. by utilizing an encoder, as disclosed by Rasmussen et al., for the purpose of precisely monitoring the angular movement of the rotatable disc . . . ." *Id.* at 2-3.

Rasmussen, however, does not teach or suggest using an encoder for comparing encoder pulses to stored numbers of encoder pulses corresponding to particular coin denominations. Instead, Rasmussen uses an encoder to determine how far a coin has moved after it has already been denominated:

> The pulses from the encoder sensor 212 are supplied to the three coin-tracking down counters CTD_D, CTC_N and CTC_Q for separately monitoring the movement of each of the three coin denominations between fixed points on the sorting head. The outputs of these three counters CTC_D, CTC_N and CTC_Q can then be used to separately control the actuation of the bag-switching bridges 80, 90 and 100 and/or the drive system. For example, when the last dime in a prescribed bath has been detected by the sensors S_1 -S_3, the dime-tracking counter CTC_D is preset to count the movement of a predetermined number of the indicia 211 on the disc periphery past the encoder sensor 212. This is a way of measuring the movement of the last dime through an angular displacement that brings that last dime to a position where the bag-switching bridge 80 should be actuated to interpose the bridge between the last dime and the next successive dime.

Rasmussen at col. 12, lines 25-42. Rasmussen does not use an encoder to help determine the denomination of coins. Rather, to denominate coins, Rasmussen uses three coin sensing pins S_1, S_2, and S_3, which determine denomination of a coin by the number of pins contacted, independent of encoder pulses:

> As can be seen in FIGS. 2 and 10-12, three coin sensors S_1, S_2 and S_3 in the form of insulated electrical contact pins are mounted in the upper surface of the recess 30. The outermost sensor S_1 is positioned so that it is contacted by all three coin denominations, the middle sensor S_2 is positioned so that it is contacted only by the nickels and quarters, and the innermost sensor S_3 is positioned so that it is contacted only by the quarters. An electrical voltage is applied to each sensor so that when a coin contacts the pin and bridges across its insulation, the voltage source is connected to ground via the coin and the metal head surrounding the insulated sensor. The grounding of the sensor during the time interval when it is contacted by the coin generates an electrical pulse which is detected by a counting system connected to the sensor. The pulses produced by coins contacting the three sensors S_1, S_2 and S_3 will be referred to herein as pulses P_1, P_2 an P_3, respectively, and the accumulated counts of those pulses in the counting system will be referred to as counts C_1, C_2, C_3, respectively.

Rasmussen at col. 10, lines 21-41. Importantly, Rasmussen does not disclose storing a number of encoder pulses corresponding to a particular coin denomination, and does not disclose comparing a counted number of encoder pulses to such a stored number of encoder pulses.

Thus, even if Hossfield and Rasmussen were combined, which, for the reasons described below, they would not have been, the resulting combination would still have been lacking

limitations of the rejected claims. Accordingly, each of the rejected claims is patentable over Hossfield in view of Rasmussen for this reason as well. *See U.S. Surgical Corp.,* 103 F.3d at 1564.

B. A Person Of Ordinary Skill in the Art Would Not Have Combined Hossfield and Rasmussen to Reach the Claimed Invention

"[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known." *KSR Int'l Co. v. Teleflex, Inc.,* 127 S.Ct. 1727, 1741 (2007). In this case, the Examiner seeks to combine two very different devices, with very different purposes, to arrive at the claimed invention. A person of ordinary skill in the art, rather than being motivated to make this combination, would have been dissuaded from combining Hossfield and Rasmussen.

Hossfield discloses a simple and inexpensive coin diameter discriminating device for use in "coin operated devices such as Laundromat equipment, vending machines, toll booths, and public telephones." Hossfield at col. 1, lines 8-13; col. 3, lines 8-14. Hossfield's device receives a single coin at a time through a coin slot into a coin cavity 20 of a disk 22. Hossfield at 3:6-18. After the coin has come to a complete stop within the coin cavity 20, a motor then begins rotating the disk 22 through a fixed angle, less than a full rotation (e.g., 90°), at a fixed and uniform rate. Hossfield at col. 3, lines 25-41; col. 5, lines 4-12. During this rotation, a sensor measures light from an LED until a time that the leading edge of the coin interrupts the beam; this amount of time is measured. Hossfield at col. 4, lines 38-54. A similar measure is made of the coin's trailing edge, here the amount of time from the beginning of rotation until a light sensor is uncovered. Hossfield at col. 4, lines 55-65. If the coin is accepted, the coin falls through a coin collection slot common to all coin denominations into a collection box. Hossfield at col. 6, lines 61-7:6.

The claims in question are directed to coin processing systems for use in high-speed, high-volume coin sorting applications, requiring flexibility in the number of coins they can process and the speed at which they can process coins. *See* Specification, Exhibit A, at ¶ 71 ("rate of about 3400 coins per minute," "disc is rotated at about 350 r.p.m."); *see also, e.g.,* claim 1 (*reciting* "continuously rotatable disc"); claim 10 (*reciting* "high-speed coin processing machine"); claim 22 (*reciting* "continuously rotatable disk"); claim 23 (*reciting* "continuously rotatable disk"). The Examiner would add several components of Rasmussen's coin sorter to Hossfield's washing machine coin discriminator to arrive at the claims. A skilled artisan would not do this, as it would needlessly drive up the size, complexity, and cost of Hossfield's device. A large and expensive coin sorting mechanism is not appropriate for washing machines, vending machines, and pay telephones. Here, common sense dictates that the claimed invention was not obvious, and that the Examiner's proposed combination never would have been made.

1. A Person of Ordinary Skill in the Art Would Not Have Altered Hossfield to Add a Continuously Rotatable Disc

Claim 1 recites a "continuously rotatable disc" for imparting motion to "a plurality of coins of mixed denominations." Claims 22 and 23 each require "moving a plurality of coins along a coin path with a continuously rotatable disk." Hossfield does not teach or suggest a continuously rotatable disc. The Examiner does not contend that Hossfield discloses this limitation or that a person of ordinary skill in the art would seek to combine Hossfield with another reference to remedy this deficiency. A person of ordinary skill in the art would not do so, as this would require modifying Hossfield with a different, more expensive, motor as well as additional equipment, such as a more complicated and expensive controller, to control the rotation. These changes would not be compatible with a simple and inexpensive vending machine coin discriminator.

Further, Hossfield expressly teaches, such as is shown in step 82 of FIG. 4A, that a short pause is utilized "to permit the coin 82a or b to stop bouncing, and to come to complete rest within coin notch 20 or pocket" (col. 2, lines 26-28). At this time, the processor 54 initializes the counters 88a and 88b (col. 2, lines 28-29). Modification of this system, which requires a period of "complete rest," to include a "continuously rotatable disc" defies explanation. Hossfield, moreover, teaches that while the coin is stationary, the metal sensor 56 uses an inductive field of a coil (not shown) to measure the coin's effect on the frequency, phase and amplitude of the

circuit's output, so that "irregularities or inconsistencies cause by motion of the coin 82a are eliminated" (col. 6, lines 1-12). Hossfield thus teaches away from modification to include a continuously rotatatable disc.

The Examiner argues that "applicant has not claimed that the rate of rotation is adjusted," citing MPEP 2106. Final Office Action at 5. Presumably, the Examiner is relying on the statement in MPEP 2106 that "[l]anguage that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation." However, the "continuously rotatable disc" limitation limits the claims to particular structure (i.e., a device with a "continuously rotatable disc" in claims 1, 22, and 23), and therefore limits the scope of the claims. "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970); *see also In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995)(*stating* "[w]hen evaluating the scope of a claim, every limitation in the claim must be considered"); *In re Lowry*, 32 USPQ2d 1031, 1034 (Fed. Cir. 1994); MPEP §§706.02(j); 2142; 2143; 2143.03. Accordingly claims 1, 22, and 23, as well as their dependents, are patentable for this reason as well.

2. A Person of Ordinary Skill in the Art Would Not Have Altered Hossfield to Add a Rate of Rotation that is Adjustable

Claim 1 recites that "a rate of rotation is adjustable." Claim 10 requires "moving a coin along the coin path defined by a stationary sorting head of a high-speed coin processing machine at a rate that can be adjusted," and claims 22 and 23 each require "moving a plurality of coins along a coin path with a continuously rotatable disk, wherein a rate of rotation is adjustable."

As with the "continuously rotatable disc" limitation, the Examiner does not contend that Hossfield discloses "a rate of rotation that is adjustable" or that a person of ordinary skill in the art would seek to combine Hossfield with another reference to remedy this deficiency. A person of ordinary skill in the art would not do so, as this would require modifying Hossfield with a different, likely more expensive, motor as well as additional equipment, such as a more complicated and expensive controller, to control the rotation. These changes would not be compatible with a simple and inexpensive vending machine coin discriminator. In the Final Office Action, the Examiner states that "Applicant argues the controller of Rasmussen. In response, the controller of Hossfield is relied upon in combination with the teaching of Rasmussen, farther see MPEP 2106." Final Office Action at 5. It is not clear what the Examiner

is arguing here, but if the Examiner contends that the controller of Hossfield is capable of performing the additional processing associated with adjusting the rate of rotation, the Examiner has pointed to no support for this. The opposite is more plausibly the case – including a large and expensive processor with unnecessary functionality to a device intended to be simple and inexpensive would have been highly illogical. Hossfield et al. explicitly raises cost as an issue, stating that "one way to avoid the dependency of coin diameter measurements on velocity is to use an array of sensors that are vertically stacked," but notes that "with this approach, diameter resolution is limited by the number of sensors employed" and adds regarding the cost of such few extra sensors that "[t]he cost for attaining higher resolution may be prohibitive" (col. 1, lines 47-54).

The Examiner argues that "the applicant has not recited that the disk is continuously rotating," citing MPEP 2106. Final Office Action at 5. Presumably, the Examiner is relying on the statement in MPEP 2106 that "[l]anguage that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation." The "rate of rotation is adjustable" and "at a rate that can be adjusted" limitations limit the claims to particular structure (e.g., a device with a "continuously rotatable disc . . . wherein a rate of rotation is adjustable" in claim 1), and therefore limit the scope of the claims. These limitations cannot be ignored. *See, e.g.*, *In re Wilson*, *supra*; *In re Ochiai*, *supra*; *In re Lowry*, *supra*. Accordingly claims 1, 10, 22, and 23, as well as their dependents, are allowable for this reason as well.

3. A Skilled Artisan Would Not Have Added an Encoder to Hossfield

Claim 1 recites a system to process coins including "an encoder attached to the rotatable disc for producing an encoder pulse for each incremental movement of the rotatable disc," claim 10 requires "counting, with the controller, the number of encoder pulses generated by an encoder during the interruption of the light beam," and claims 22 and 23 each require "generating an encoder pulse for each incremental movement of the continuously rotatable disk." The Examiner has acknowledged that Hossfield "does not disclose an encoder that produces an encoder pulse for each incremental movement of the rotatable disc . . . ." Final Office Action at 2. Instead, the Examiner argues that a person of ordinary skill in the art would combine an encoder from Rasmussen with Hossfield's device "for the purpose of precisely monitoring the angular movement of the rotatable disc . . . ." Final Office Action at 2-3.

Hossfield, however, teaches away from the use of an encoder. Hossfield relies on a motor that produces a fixed and uniform rate of rotation such that a measurement of a coin can be made purely by measuring the amount of time it takes from the beginning of rotation for a leading edge of a coin to interrupt light from an LED: "As described heretofore, the angular velocity of rotation is very uniform because it is accurately controlled by motor 42 at 0.6° per high frequency pulse from processor 54, so the counts in counters 88a and b also accurately represent the respective angular orientations of disk 22 when the leading and trailing edges of the coin 82a or b arrive at or intersect respective light sensors 52a and b." Hossfield at col. 5, lines 13-19. (emphasis added). There is simply no need to precisely monitor the angular movement of the disk in Hossfield. The disk's angular movement is tightly controlled and does not need to be measured in order to determine its rotation. This is especially true since the rotation is "very uniform" and does not vary – measuring using an encoder would have been unnecessary and would have provided completely redundant information. Importantly, information generated by an encoder would not be used by the Hossfield device, as there is no variability in rotation to track with an encoder.

In response to Applicants' arguments, the Examiner states, without explanation, that "Hossfield teaches accurately controlling the motor and it would have been obvious to modify Hossfield by using an encoder to provide precise monitoring." Final Office Action at 5. Hossfield does disclose accurately controlling the motor; however, the motor is accurately controlled to produce angular rotation that is "very uniform." Hossfield at col. 5, lines12-15. An encoder is only useful if the rotation is variable, and thus there is something to monitor. For example, in Rasmussen, an encoder is described in conjunction with a speed reducer and a brake: "The disc is normally driven by a main a-c drive motor M1 which is coupled directly to the coin-carrying disc 13 through a speed reducer 210. To stop the disc 13, a brake B is actuated at the same time the main motor M1 is de-energized. To permit precise monitoring of the angular movement of the disc 13, the outer peripheral surface of the disc carries an encoder . . . ." Rasmussen at col. 12, lines 12-18. In Hossfield, there is nothing to monitor; the rotation is always the same.

Adding an encoder would add to the expense of Hossfield's device and increase its size, such added expense itself running contrary to the clearly expressed intent in Hossfield to avoid unnecessary costs (see, e.g., col. 1, lines 47-54) . Given the device's target application, (e.g.,

vending machines, washing machines, pay telephones, etc.) a person of ordinary skill in the art would not seek to make the device larger, more complicated, and more expensive, by adding an encoder and additional hardware, logic, a bigger and more expensive processor, new software, etc., for interpreting it, especially since an encoder's functionality is completely unnecessary. *See, e.g., In re Ratti*, 270 F.2d 810 (CCPA 1959) ("[i]f a proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the reference are not sufficient to render the claims prima facie obvious."). Instead, Hossfield's intended applications require simple and inexpensive devices of limited features and size. The Examiner is arguing that the rejected claims are obvious based on a combination that a person of ordinary skill in the art would have found impractical and unworkable and never would have made.

Accordingly, the rejected claims are patentable for this reason as well.

4. A Skilled Artisan Would Not Have Added a Diverter or a Plurality of Exit Regions to Hossfield

Claim 8 recites "a diverter disposed along the coin path beyond the light source, the diverter being moveable between a first position for permitting coins to proceed to the plurality of exit channels and a second position for diverting coins to a reject region" and claim 10 recites "a plurality of coin exit regions."

The Examiner has also acknowledged that Hossfield "does not disclose . . . a diverter with positions to plural exit paths." Final Office Action at 2. The Examiner states, without explanation, that "Hossfield teaches a machine for identifying coins and it would be obvious to a person of ordinary skill in the art to modify Hossfield by utilizing a diverter and plural exit paths for the purpose of sorting coins . . . ." Final Office Action at 6 (citing to July 24, 2008, Office Action, Exhibit I, ¶ 1, which does not provide further explanation). Hossfield is directed to a device that identifies the denomination of coins in a vending machine, pay telephone, etc. Hossfield at col. 3, lines 8-14. The device is not intended to sort coins, nor would there be any motivation to do so, as a person of ordinary skill in the art would seek a simple device of limited function, limited size, and limited cost, given the target applications specifically recited in Hossfield. Moreover, a person of ordinary skill in the art would have to had to have added additional structure, such as a plurality of coin bins, to collect the coins diverted to multiple paths. This would add even more size, complexity, and expense. Thus, Hossfield teaches away

from adding a diverter and multiple exit paths, and a person of ordinary skill in the art would not have sought to combine Rasmussen with Hossfield for this feature. Once again, common sense dictates that a person of ordinary skill in the art would not have made this combination, and claims 8 and 10 (and its dependent claims) are patentable for this reason as well.

C. Claims 3, 4, 6, 7, 15, and 21 are Not Obvious Over Hossfield in View of Rasmussen and in Further View of Panzeri

Claim 3 depends on claim 1 and claim 4 depends on claim 4. Claim 3 additionally requires that "the light beam comprises a laser beam" and claim 4 requires that "the light source is a single laser diode." Claim 6 depends on claim 1 and claim 7 depends on claim 6. Claim 6 adds that "at least one light guide for guiding light received from the light source to the light detector" and claim 7 adds that "the light guide has an inlet disposed along the coin path opposite the light source." Claim 15 depends on claim 10 and claim 21 depends on claim 16. Each of claims 15 and 21 adds "receiving the light beam with at least one light guide and directing the received light to the light detector."

Claims 3, 4, 6, 7, 15, and 21 are each patentable for the reasons described above for claims 1 and 10. Applicants submit that Panzeri is insufficient to make up for the deficiencies of Hossfield and Rasmussen, whether such references are taken singly or in combination. The Examiner never contends otherwise.

The Examiner acknowledges that Hossfield and Rasmussen, alone or in combination, do not teach "a laser diode and at least one light guide along the coin path." Final Office Action at 3. The Examiner argues that Panzeri discloses "a similar device that includes a laser diode (11) and at least one light guide (12) along the coin path for the purpose of producing a laser beam (see column 6 line 56) and increasing the size of the laser beam to impinge upon larger portions of a coin (see column 6 lines 60-63)" and alleges that "[i]t would have been obvious for a person of ordinary skill in the art at the time of the applicant's invention to modify Hossfield et al. in view of Rasmussen et al. by utilizing a laser diode, as disclosed by Panzeri et al., for the purpose of producing a laser beam and increasing the size of the laser beam to impinge upon larger portions of a coin." *Id.*

1. Panzeri Does Not Disclose a Light Guide As Required by Claims 6, 7, 15, and 21

Claims 6, 7, 15, and 21 each require a "light guide." Specifically, claim 6 requires "at least one light guide for guiding light received from the light source to the light detector," claim 7 requires that "the light guide has an inlet disposed along the coin path opposite the light source," and claims 15 and 21 each require "receiving the light beam with at least one light guide and directing the received light to the light detector." As explained in the specification of Exhibit A, "Generally, the first and second light guides 802, 804 [sic, 804, 806] receive light from the light source 802 and guide the received light to the light detector 808." Exhibit A at ¶ [0105]. The light guides are shown in FIGs. 14b and 14c:

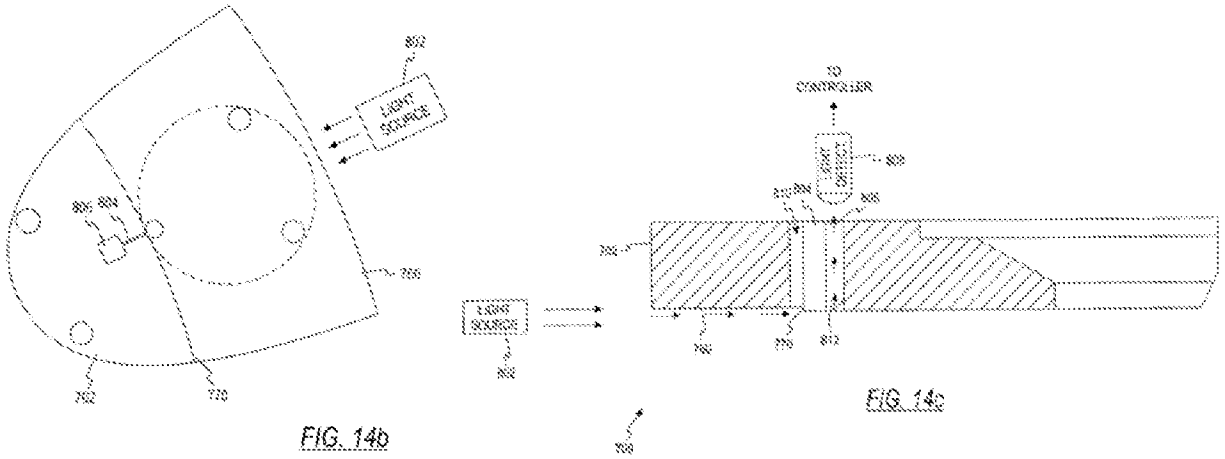

FIG. 14b FIG. 14c

As explained in the specification, "the bottom portion (as viewed in FIG. 14c) of the first light guide 804 is used in receiving light and directing the received light to the second light guide 406 [sic 806], the first light guide 804 . . . ." Exhibit A at ¶ [0106].

The Examiner points to item 12 in Panzeri as being a light guide. Final Office Action at 3. Item 12 is not a light guide for guiding light. It is a "lens group" that spreads the light from the laser diode 11 into a "fan-like shape . . . so that the beam can be used to impinge upon larger portions of the coin simultaneously." Panzeri at col. 6, lines 57-63 and FIG. 1.

Thus, none of Hossfield, Rasmussen, and Panzeri discloses a light guide. Accordingly, each of claims 6, 7, 15, and 21 is patentable over Hossfield in view of Rasmussen and Panzeri for this reason as well. *See U.S. Surgical Corp.,* 103 F.3d at 1564.

2. A Person of Ordinary Skill in the Art Would Not Have Combined Panzeri With Hossfield or Rasmussen

As explained above, Rasmussen does not disclose determining the denomination of coins using light sensors. Instead, Rasmussen uses three coin sensing pins S_1, S_2, and S_3, which determine denomination of a coin by the number of pins contacted, independent of encoder pulses. *See* Rasmussen at col. 10, lines 21-41. Thus, a person of ordinary skill in the art would not have combined the LED and lenses of Panzeri with Rasmussen.

A person of ordinary skill in the art also would have been dissuaded from combining Panzeri's LED and lenses with Hossfield. The Examiner argues that "[i]t would have been obvious for a person of ordinary skill in the art at the time of the applicant's invention to modify Hossfield et al. in view of Rasmussen et al. by utilizing a laser diode, as disclosed by Panzeri et al., for the purpose of producing a laser beam and increasing the size of the laser beam to impinge upon larger portions of a coin." Final Office Action at 2. However, the Examiner does not explain how Hossfield's device would have benefitted from a wider beam impinging on larger portions of a coin. If anything, this would have decreased the accuracy of Hossfield's device as it would have introduced ambiguity as to when a coin's leading or trailing edge intersected the light sensors.

Moreover, adding lenses to spread and collimate light from a laser diode, as described in Panzeri, would have added additional size, complexity, and cost to Hossfield's device. This would have been on top of the additional size, complexity, and cost of adding all of the additional structure the Examiner allegedly found in Rasmussen and necessary to render the claims obvious. Once again, "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR Int'l Co.,* 127 S.Ct. at 1741. Here, common sense dictates that a person of ordinary skill in the art would not have rendered Hossfield's device impractical and unworkable by loading it up with expensive and unnecessary structure. The Examiner's hindsight reconstruction of claims 3, 4, 6, 7, 15, and 21 should be rejected. Accordingly, each of these claims is patentable over Hossfield in view of Rasmussen and Panzeri.

VIII. CLAIMS APPENDIX

A clean copy of the pending claims 1-27 involved in the appeal is included in the Claims Appendix.

IX. EVIDENCE APPENDIX

A copy of the evidence relied upon by the Appellant and where each was entered in the record is included in the Evidence Appendix.

X. RELATED PROCEEDINGS APPENDIX

As there are no related proceedings, no information is provided in the Related Proceedings Appendix.

XI. CONCLUSION

For at least the foregoing reasons, the rejection of appealed claims 1-27 set forth in the Final Office Action mailed January 7, 2009, should be reversed.

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CLAIMS APPENDIX

1. A coin processing system, comprising:

a continuously rotatable disc for imparting motion to a plurality of coins of mixed denominations, wherein a rate of rotation is adjustable;

an encoder attached to the rotatable disc for producing an encoder pulse for each incremental movement of the rotatable disc;

a memory adapted to store master denominating characteristic information including a plurality of predetermined numbers of encoder pulses, each predetermined number of encoder pulses corresponding to the size of a particular coin denomination the coin processing system is adapted to process;

a stationary sorting head having a lower surface generally parallel to and spaced slightly away from the rotatable disc, the lower surface forming a coin path for directing the movement of each of the coins and a coin exit region for sorting and discharging coins of particular denominations;

a light source for outputting a light beam that traverses the coin path in substantially the same plane as the coin path;

a light detector for detecting the light beam, the light detector being adapted to generate a light-detection signal indicative of detecting the light beam, each coin moving along the coin path passing through the light beam resulting in the suspension of the generation of the light-detection signal; and

a controller adapted to receive the encoder pulses from the encoder, the controller adapted to receive the light-detection signal from the light detector, the controller being adapted to determine the number of encoder pulses received during a period of non-receipt of the light-detection signal caused by each coin passing through the light beam, the controller being adapted to compare the determined number of encoder counts to the stored master denominating characteristic information upon resuming to receive the light-detection signal from the light detector.

2. The coin processing system of claim 1 wherein the controller is adapted to determine the denomination of the coin passing through the light beam when the determined

number of encoder pulses favorably compares to the stored master denominating characteristic information.

3. The coin processing system of claim 1 wherein the light beam comprises a laser beam.

4. The coin processing system of claim 3 wherein the light source is a single laser diode.

5. The coin processing system of claim 1 wherein the light detector is a photodetector.

6. The coin processing system of claim 1 further comprising at least one light guide for guiding light received from the light source to the light detector.

7. The coin processing system of claim 6 wherein the light guide has an inlet disposed along the coin path opposite the light source.

8. The coin processing system of claim 1 further comprising a diverter disposed along the coin path beyond the light source, the diverter being moveable between a first position for permitting coins to proceed to a plurality of exit channels and a second position for diverting coins to a reject region.

9. The coin processing system of claim 8 wherein the controller causes the diverter to move from the first position to the second position when the number of encoder pulses determined when a coin passes through the light beam does not favorably compare to the stored master denominating characteristic information.

10. A method for processing coins with a coin processing system including at least one coin path and a plurality of coin exit regions for sorting and discharging coins of particular

denominations, the system including a light source, disposed on one side of the coin path, comprising:

moving a coin along the coin path defined by a stationary sorting head of a high-speed coin processing machine at a rate that can be adjusted;

emitting a light beam across the coin path in substantially the same plane as the coin path to a light detector disposed on another side of the coin path;

interrupting, with the coin moving along a portion of the coin path between the light source and the light detector, the light beam traversing the coin path such that the light beam is not incident on the light detector;

counting, with the controller, the number of encoder pulses generated by an encoder during the interruption of the light beam; and

comparing the counted number of encoder pulses to a plurality of stored numbers of encoder pulses corresponding to the particular coin denominations.

11. The method of claim 10 wherein the light beam comprises a laser beam.

12. The method of claim 10 comprising determining the denomination of the coin when the counted number of encoder pulses favorably compares to one or more of a plurality of stored numbers of encoder pulses corresponding to the particular coin denominations.

13. The method of claim 10 comprising determining the coin to be an invalid coin when the counted number of encoder pulses does not favorably compare to a number of encoder pulses corresponding to a particular coin denomination.

14. The method of claim 13 comprising diverting the coin from the coin path when the coin is determined to be an invalid coin.

15. The method of claim 10 further comprising receiving the light beam with at least one light guide and directing the received light to the light detector.

16. The method of claim 10, further comprising:

generating at least a first signal event corresponding to an interruption of the light beam by a leading edge of the coin moving along the coin path;

generating at least a second signal event when the light beam is incident to the light detector following the act of the generating at least a first signal event;

counting a number of encoder pulses occurring between the acts of generating at least the first signal event and generating at least the second signal event; and

comparing at least the counted number of encoder pulses to a plurality of stored numbers of encoder pulses corresponding to the particular coin denominations.

17. The method of claim 10, further comprising:

generating a first light-detection output when the light beam traversing the coin path is incident upon the light detector; and

generating a second light-detection output when the light beam traversing the coin path is not incident upon the light detector.

18. The method of claim 16 comprising determining the denomination of the coin when the counted number of encoder pulses favorably compares to a plurality of stored numbers of encoder pulses corresponding to the particular coin denominations.

19. The method of claim 16 comprising determining the coin to be an invalid coin when the counted number of encoder pulses does not favorably compare to a plurality of stored numbers of encoder pulses corresponding to the particular coin denominations.

20. The method of claim 19 comprising diverting the coin from the coin path when the coin is determined to be an invalid coin.

21. The method of claim 16 further comprising receiving the light beam with at least one light guide and directing the received light to the light detector.

22. A method for determining the denomination of a coin with a disk-type coin processing system, comprising:

moving a plurality of coins along a coin path with a continuously rotatable disk, wherein a rate of rotation is adjustable;

generating an encoder pulse for each incremental movement of the continuously rotatable disk;

directing a light beam to traverse the coin path in substantially the same plane as the coin path;

interrupting the light beam traversing the coin path for a period in which a coin of the plurality of coins is moving through the light beam traversing the coin path;

counting a number of encoder pulses occurring during the period; and

comparing the counted number of encoder pulses to a plurality of stored numbers of encoder pulses corresponding to the particular coin denominations.

23. A method for determining the denomination of a coin with a disk-type coin processing system, comprising:

moving a plurality of coins along a coin path with a continuously rotatable disk, wherein a rate of rotation is adjustable;

generating an encoder pulse for each incremental movement of the continuously rotatable disk;

directing a light beam to traverse the coin path in substantially the same plane as the coin path;

detecting the light beam with a light detector;

developing a signal at the light detector indicating the presence of a coin of the plurality of coins in the coin path;

counting a number of encoder pulses occurring while developing the signal at the light detector; and

comparing the counted number of encoder pulses to a plurality of stored numbers of encoder pulses corresponding to the particular coin denominations.

24. The method of claim 23 wherein developing further comprises:

generating a signal at the light detector that is proportional to the amount of detected light;

comparing the generated signal to a threshold value stored in memory; and

determining the signal to be a signal indicating the presence of a coin in the coin path when the generated signal is below the threshold value.

25. The method of claim 24 wherein the generated signal is a voltage signal.

26. The method of claim 24, further comprising:

interrupting the light beam traversing the coin path for a period in which the coin is moving through the light beam traversing the coin path.

27. The coin processing system of claim 1, wherein the stationary sorting head lower surface forms a common coin path which directs the movement of all coins prior to sorting of coins having different denominations into separate coin paths for discharge from an exit region associated with a particular denomination, and wherein said light source is disposed to output a light beam that traverses the coin path at a point along such common coin path.

EVIDENCE APPENDIX

Appellant's published application (2005/0006197)	Exhibit A
Final Office Action dated January 7, 2009	Exhibit B
Notice of Appeal filed March 6, 2009	Exhibit C
Pre-Appeal Request for Review	Exhibit D
Notice of Panel Decision from Pre-Appeal Request for Review	Exhibit E
Hossfield et al. (US 5,684,597), as cited by the Examiner in the Office Action dated January 7, 2009	Exhibit F
Rasmussen et al. (US 5,227,651), as cited by the Examiner in the Office Action dated January 7, 2009	Exhibit G
Panzeri et al. (US 6,142,285), as cited by the Examiner in the Office Action dated January 7, 2009	Exhibit H
Office Action dated July 24, 2008	Exhibit I

RELATED PROCEEDINGS APPENDIX

As there are no related proceedings, no information is provided in the Related Proceedings Appendix.